
State of Wisconsin \ GROUNDWATER COORDINATING COUNCIL

Scott Walker, Governor

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
FAX 608-267-7650
TDD 608-267-6897

# Joint Solicitation

## State of Wisconsin Groundwater Research and Monitoring Proposals for State FY 2016

**(July 1, 2015 – June 30, 2016)**

**Facilitated by:**
**Wisconsin Groundwater Coordinating Council**
**University of Wisconsin Water Resources Institute**

**Participating agencies:**
**University of Wisconsin System**
**Wisconsin Department of Natural Resources**
**Wisconsin Department of Agriculture, Trade and Consumer Protection**
**Wisconsin Department of Safety and Professional Services**

## Proposal Submission Deadline:
## 5 p.m. CST, Friday, November 21, 2014

**Contact: Jennifer Hauxwell, University of Wisconsin Water Resources Institute (jennifer.hauxwell@aqua.wisc.edu); Mary Ellen Vollbrecht, Department Natural Resources (Mary.Vollbrecht@wisconsin.gov); or William L. Phelps, Department Natural Resources (William.Phelps@wisconsin.gov) if you have questions or wish to be removed from the mailing list for this annual solicitation.**


**State of Wisconsin \ GROUNDWATER COORDINATING COUNCIL**

Scott Walker, Governor

**101 South Webster Street**
**Box 7921**
**Madison, Wisconsin 53707**
**FAX 608-267-7650**
**TDD 608-267-6897**

Date: October 14, 2014

To: Interested Researchers
From: Russ Rasmussen, Groundwater Coordinating Council
James Hurley, University of Wisconsin Water Resources Institute
Subject: Joint Solicitation for Groundwater Research and Monitoring

Enclosed is information on the State of Wisconsin Joint Solicitation for Groundwater Research and Monitoring. The solicitation is a coordinated effort of the University of Wisconsin System, and the Wisconsin Departments of Natural Resources; Agriculture, Trade and Consumer Protection; and Safety and Professional Services.

This cooperative solicitation allows interested individuals to prepare project proposals that can be submitted to several different funding sources simultaneously and eliminates the need to submit similar proposals several times for different solicitation efforts.

Funding is available for new monitoring or research to meet specific agency needs and objectives. Up to $400,000 will be available for new groundwater projects for Wisconsin Fiscal Year 2016.

You are invited to review the enclosed materials and decide if you wish to submit proposals. **The deadline for submittals is 5 p.m. CST Friday, November 21, 2014.** Investigators for both programmatic requests are required to submit proposals using *iPropose,* a Web-based proposal submission system that will open for registration on Thursday, October 23, 2014. Please visit *http://wri.wisc.edu* for more information.

It is our intent that this joint solicitation will make it easier for interested researchers to prepare proposals, promote coordination among state agencies and researchers, and enhance the ability of state agencies and the UW System to meet their objectives.

**Russ Rasmussen**
**Council Chair**
DNR

**James Robertson**
WGNHS

**Henry Anderson, MD**
DHS

**James Hurley**
UWS

**Eric Scott**
DSPS

**Dan Scudder**
DOT

**John Petty**
DATCP

**George Kraft**
GOVERNOR'S REP.

## I. Wisconsin Groundwater Research and Monitoring Program Proposals

**A. Overview.** The University of Wisconsin System (UWS) and the Wisconsin Departments of Natural Resources (DNR); Agriculture, Trade and Consumer Protection (DATCP); and Safety and Professional Services (DSPS) annually participate in a joint solicitation for research and monitoring proposals dealing with groundwater, pesticides and/or on-site wastewater treatment systems. Up to $400,000 will be available for groundwater-related monitoring and research in fiscal year 2016 (FY 16) for new projects. The four programs, collectively called the Wisconsin Groundwater Research and Monitoring Program (WGRMP), are summarized as follows:

UWS Groundwater Research - The UWS, through its Water Resources Institute (WRI), has received funding since FY 90 for groundwater research. Projects may be of a fundamental or applied nature on selected aspects of groundwater research in the natural sciences, engineering, social sciences or law. Through FY 15, the UWS has invested $7.1 million on 179 groundwater research projects. Several projects have been co-funded with DNR, DSPS and/or DATCP and 13 were co-funded through the National Institutes for Water Resources program (U.S. Geological Survey). WRI has also invested $382,000 on seven climate change projects funded through the National Institutes for Water Resources/USGS. The UWS will have up to $200,000 to fund new projects in FY 16.

DNR Groundwater Monitoring and Research - The DNR has been funding groundwater "management-practice monitoring" projects since FY 86. The intent of these studies, funded through the Groundwater Account of the Environmental Fund, was to identify appropriate management practices to reduce the impacts of potential sources of contamination. In recent years, the DNR has used funds from alternative state and federal sources, and has targeted funds at specific issues of concern, including arsenic, emerging contaminants (viruses, antibiotics) and groundwater quantity. Through FY 15, the DNR will have spent approximately $7.7 million on 219 monitoring and research projects. Several of these projects have been co-funded with DATCP, DSPS and/or UWS. The DNR anticipates having between $150,000 to $250,000 to support groundwater research and monitoring studies in FY16.

DATCP Pesticide Research - From 1989 to 2002, DATCP had approximately $135,000 available annually to fund research on pesticide issues of regulatory importance. This money came from fees paid by pesticide manufacturers to sell products in Wisconsin. Through FY 15, DATCP has spent about $1.8 million on 42 pesticide projects. Some of these projects were co-funded with DNR and/or UWS. Due to budget constraints, DATCP will not have money to fund any new projects in FY 16. DATCP will, however, take part in the proposal review process.

DSPS On-site Wastewater Treatment System Research - The Division of Safety and Buildings (formerly in the Department of Commerce and the Department of Industry, Labor and Human Relations) received an annual appropriation of $50,000 from 1990 to 1993 to fund research on alternatives to current private sewage-system technology. In 1994, when the appropriation expired, $75,000 generated through plan review and licensing fees became available each year for research on private sewage systems. Through FY 15, approximately $600,000 has been spent on eight projects. Two projects were co-funded with DNR and UWS. Due to budget shortfalls, DSPS will not have



ED_004892B_00000002-00003

money to fund research projects in FY 16. DSPS will, however, take part in the proposal review process.

The Wisconsin Groundwater Coordinating Council (GCC) provides consistency and coordination among the four state agencies in funding groundwater monitoring and research to meet state agency needs. See the "Research and Monitoring" page on the GCC website: *http://dnr.wi.gov/topic/Groundwater/GCC/research.html*. This solicitation is coordinated jointly to facilitate proposal writing, streamline the review process, curtail duplication, improve coordination among agencies and researchers, and enhance communication among the agencies and among principal investigators. Joint funding of some projects may be appropriate, but joint funding is not the purpose of this solicitation because each agency has its own designated mission and priorities. Although all proposals received will be distributed to each agency, each investigator is asked to identify the agency whose mission and priorities best match his or her project.

Please read the solicitation carefully; it contains a description of the priorities for each agency program and other pertinent information, including the online proposal submission process. Capital items may not be purchased with these funds. Generally, faculty salaries plus fringe benefits should not exceed 10 percent of an individual grant.

Investigators who are new to this program are encouraged to solicit an example proposal from the agency contacts listed below.

If you have questions, please contact the following.

**Jennifer Hauxwell**, UWS, (608) 262-0905; jennifer.hauxwell@aqua.wisc.edu
**Mary Ellen Vollbrecht**, DNR Mary.Vollbrecht@wisconsin.gov or
**William L. Phelps**, DNR William.Phelps@wisconsin.gov
**Jeff Postle,** DATCP, (608) 224-4503; jeff.postle@wisconsin.gov

Please note that each agency has separate requirements for eligibility for WGRMP projects. Review the agency-specific sections carefully. In general:

| | |
|---|---|
| UWS: | Funds are restricted for use by faculty within the UW System or by academic staff who have achieved nomination to principal investigator status. |
| DNR and DSPS: | Funds are restricted to use by UW System and state and county agency contractors. |
| DATCP: | Any college or university, research foundation or individual having a demonstrated capacity in pesticide or other applicable research may submit proposals. |

Investigators who are not affiliated with the state and therefore not eligible for funding by UWS, DNR or DSPS may wish to collaborate on a proposal with a UWS investigator or state agency staff member.

Principal investigators who are significantly overdue with completed final reports to this program will not be eligible for new funding. In the case of UWS, reports are considered significantly



ED_004892B_00000002-00004

overdue six months after the initially specified or understood completion dates. The GCC may consider extenuating circumstances on a case-by-case basis.

**B. WGRMP Proposal Submission, Review and Administration**

**1. Submission of Proposals.** WGRMP proposals will be submitted via *iPropose*, a Web-based proposal submission system located at *https://aqua.wisc.edu/ipropose*. The *iPropose* system will open for registration and submittal of proposals on Thursday, October 23, 2014. The deadline for submittal of proposals is 5 p.m. CST on Friday, November 21, 2014.

Investigators will be required to provide the following information when submitting proposals:

a. An abstract, list of investigators, location of the research, targeted agencies, three to five suggested reviewers and their areas of expertise (two of the reviewers suggested must be from outside of Wisconsin), and the name of the department and the administrator(s) responsible for financial management of the project if funded.

b. A proposal narrative in Adobe Portable Document File (PDF) format. A template for the proposal narrative is available for download from the WRI website *(http://www.wri.wisc.edu)* in both Microsoft Word and WordPerfect formats.

c. A budget spreadsheet in Microsoft Excel format. A template for the budget spreadsheet is available for download from the WRI website in Microsoft Excel format.

d. Administrative approval from an official authorized to sign proposal submissions.

To create a PDF file, investigators may use the online or the desktop version of Adobe Acrobat software. Adobe online offers a monthly subscription service for creating PDF files and a free trial subscription. Visit *http://adobe.com/go/tryacrobatsuite/* for more information.

Proposals should be no longer than 18 pages. All pages should be 8.5" x 11". The project summary, narrative, curriculum vitae and support pages should each start on a new page, have at least 1.5 line spacing (except for Figure and Table legends) and use no smaller than 11-point type. All margins should be no less than 0.75 inches. The proposal must be consecutively paginated on the bottom of the page. Include literature citations in the proposal where appropriate (the bibliography should be single-spaced within, double-spaced between). Any section of a proposal that exceeds the specified maximum page limits will be grounds for returning the proposal to the author.

*Guidelines for Proposal Submission* begin on page 4 and a checklist is available for download on the WRI website. All proposals must be submitted using these instructions. No facsimiles of proposals and no hand-written proposals will be accepted. Special attachments (maps, brochures, etc.) will be accepted, noted and kept on file, but will not be included in the package of materials submitted to reviewers.

**2. Review of Proposals.** All proposals received through the WGRMP joint solicitation process receive reviews from the following four groups:

a. External peer review: The WRI solicits and obtains a minimum of three external peer reviews of all proposals.
b. The Research and Monitoring Subcommittee of the GCC.
c. The Groundwater Research Advisory Council for UWS.
d. Staff from the funding agencies.



ED_004892B_00000002-00005

The two most important considerations of the reviewers are 1) whether the proposal meets agency priorities as outlined in this solicitation and 2) whether the proposal is well written and scientifically sound. Other criteria include project cost, proposed timeline, whether the proposed project methodology meets the stated objectives, whether the resources requested are adequate to carry out the project, whether the project investigators have the abilities to complete the proposed project, and, if applicable, how the proposed project relates to past WGRMP-funded projects and how it may extend our knowledge.

Funding decisions will be made by the end of March 2015. Proposals that are not chosen for funding through this solicitation may be referred to other funding sources for their consideration with permission of the investigators. Likewise, other funding organizations may refer proposals to the funding agencies involved in this solicitation.

**3. Administration of Projects.** Proposals that are funded become the property of the granting Wisconsin state agency. Please note that each agency has separate mechanisms for administering funds, and separate requirements for reporting. However, all investigators will be asked to submit a two-page project summary upon completion of the project and to make a copy of the final report available to Wisconsin's Water Library, housed at WRI. For more information, please contact Mary Ellen Vollbrecht (Mary.Vollbrecht@wisconsin.gov) or Jennifer Hauxwell (jennifer.hauxwell@aqua.wisc.edu).

**4. Dissemination of Project Findings.** Final reports are required for each project funded through this solicitation. Reports from UWS-funded projects are kept at Wisconsin's Water Library (http://aqua.wisc.edu/waterlibrary/). DATCP-, DSPS- and DNR-funded reports are kept on file with the respective agencies, but many are provided to Wisconsin's Water Library for public distribution. All project investigators must submit a two-page project summary upon completion of the final report. Multiple-year projects funded through UWS are also required to submit concise annual reports through an online Project Reporting system which can be found at *http://aqua.wisc.edu/reports*. Projects funded by DNR, DATCP and DSPS are required to submit quarterly reports.

Wisconsin's Water Library catalogs all WRI research reports into WorldCat and MadCat, two library indexing tools that provide worldwide access to the research. By having this information permanently indexed, the results are easily available to other scientists, policy makers and stakeholders. The library has also partnered with University of Wisconsin Digital Collections to digitize and post final reports. Full-text reports are available in the Ecology and Natural Resources Digital Collection (*http://digital.library.wisc.edu/1711.dl/EcoNatRes.Groundwater*).

**C. Guidelines for Proposal Submission for WGRMP Proposals**

**Investigators are required to submit proposals using *iPropose*** (a Web-based proposal submission system developed by WRI). The deadline for submission is 5 p.m. CST Friday, November 21, 2014. **The submission system will open on October 23, 2014 and is located at** *https://aqua.wisc.edu/ipropose*.

The steps for entering information and uploading a proposal are relatively simple. The overall proposal format is identical to previous years, and a checklist is available for download on the WRI website. There are eight steps in the proposal assembly process, and we recommend that investigators concentrate on step one and step two prior to submitting online:



ED_004892B_00000002-00006

**STEP 1: Prepare full proposal to WGRMP.** Please use the Microsoft Word or WordPerfect templates that can be downloaded from the WRI website (*http://wri.wisc.edu*). The proposal will consist of the following items:

A. Title, Investigators, Affiliations of Investigators (top of first page)

B. Project Summary (begin on same page; **not to exceed 2 pages**; minimum of 11-point font and 1.5 line spacing)

   1. Specific groundwater or related problem addressed by research/monitoring proposal.
   2. What will findings contribute to problem solution or understanding?
   3. Project objectives.
   4. Project approach to achieve objectives, including methods and procedures.
   5. Potential users of project findings.

C. Proposal Narrative (begin on new page; **not to exceed 10 pages**; minimum of 11-point font and 1.5 line spacing)

   1. Objectives.
   2. Background information describing prior research/monitoring relevant to objectives and, if applicable, relationships to other projects funded through the WGRMP; references to ongoing projects and how they relate to proposed investigation; information gaps that will be filled by the proposed project.
   3. Project plan outlining experimental design and schedule.
   4. Methods detailed enough to convince the reviewer that the investigators are up-to-date on modern techniques; a general statement alluding to techniques is not acceptable.
   5. Relevance to groundwater-related problems and agency priorities.
   6. Citation list.
   7. Training support (if any) provided by the project and information dissemination plan.

D. Curriculum Vitae of principal investigators (begin on new page; **not to exceed 4 pages total**). Provide curriculum vitae (including recent publications) for each investigator and state the percentage of time that each will spend on the project (whether funding is requested for that individual or not).

E. Current or Pending Support (begin on new page; **not to exceed 2 pages**).

After the full proposal is prepared, convert it to Adobe PDF format and save it on your local computer or network. When you submit your proposal package online you will be uploading this PDF file. The system requires that the proposal be in Adobe Acrobat PDF format (.pdf).

**STEP 2: Prepare budget information.** Please use the Microsoft Excel budget spreadsheet that can be downloaded from the WRI website (*http://wri.wisc.edu*). Use the WGRMP Excel spreadsheet titled "Groundwater_Budget.xls." The budget will consist of the following items:

A. Salaries and Wages.



ED_004892B_00000002-00007

B. Fringe Benefits.

C. Tuition Remission Charges (if applicable).

D. Supplies and Publication Costs (list office, lab, computer and field supplies separately).

E. Travel (to support field operations only; travel for meetings is excluded due to limited funding).

F. Other Costs (e.g., equipment maintenance and fabrication, subcontracts, rentals, etc.).

**Please note:** At the point of submission, the funding source should be considered State of Wisconsin General Program Revenue funds. *Campus indirect costs do not apply.* In the event a proposal from a UW System campus is selected for funding by the DNR, DSPS or DATCP, the budget may need to be revised to include the campus' indirect costs, depending on the source of the funding the agency uses to fund the proposal.

Save the Excel budget file on your local computer or network as you work on it. When you submit your proposal package online you will be uploading this Excel file.

**STEP 3: Create an *iPropose* account.** Developed by WRI, *iPropose* is a Web tool for submitting your proposal. Investigators must register online (*https://aqua.wisc.edu/iPropose*) before submitting proposals. **Note:** *iPropose* will open for registration and submission on October 23, 2014. Instructions on the site will assist you in entering your proposal package.

Steps 4 through 6 (below) may be completed separately. *You do NOT need to upload your entire proposal package in a single session.* Your account will remain active through the submission deadline, and you may edit each section until your proposal is officially submitted (see Step 7). **Note:** Your proposal is not officially submitted until you click on the "Submit Proposal" button.

**STEP 4: Enter information about your proposal into the online system:**

A. Title.

B. Abstract (condensed version of project summary, 300 words maximum). We recommend that the abstract be prepared in a word-processing program, saved locally and then copied and pasted into the online form. This suggestion is for your protection in case there are technical problems with your submission.

C. Location of field research.

D. Principal and associate investigators.

E. Ranking of agencies in order of preference or relevance for funding: UWS, DNR, DATCP and DSPS. (Note that this ranking does not exclude consideration of a proposal by any of the agencies, but it does assist the reviewers in evaluating the proposal.)

F. The name of at least one financial contact and the department/entity where project will be administered if approved for funding.

G. Names and email addresses of three qualified reviewers, including their areas of expertise (two of the reviewers must be from outside Wisconsin).



ED_004892B_00000002-00008

**STEP 5: Upload the proposal PDF into the online system.** This is the file that you prepared in Step 1.

**STEP 6: Upload the budget information Excel file into the online system.** This is the file that you prepared in Step 2.

**STEP 7: Submit your proposal.** Please review the accuracy of the information provided before submitting your proposal. To formally submit your proposal package, select the "Submit Proposal" button at the bottom of your screen. **This step MUST be done by 5 p.m. CST Friday, November 21, 2014.**

**STEP 8: Provide administrative approval.** All proposal submissions require administrative approvals and clearances before they can be considered. Please refer administrative staff reviewing your submission to Step 2 of these guidelines, "Prepare budget information," for details about the source of funds used for this competition.

**Campuses other than UW-Madison:** An email stating that the proposal has received all required approvals and clearances must be sent to Terri Liebmann (terri@aqua.wisc.edu). This email must be from a campus official who is authorized to approve grant applications. Attachment of official transmittal documents or electronically routed authorization forms is also acceptable. This administrative approval must be sent **by 5 p.m. CST Friday, November 21, 2014.**

**UW-Madison:** Applicants should use the WISPER electronic routing application in order to secure department and dean/director/division-level authorizations. Division-authorized WISPER records should be routed to WISPER user TERRI LIEBMANN in department 34-9600. Please set the "Submission Method" field in the WISPER record to "Internal Routing Only." The record does not have to be routed through RSP at this time. If the proposal is ultimately selected for funding by the DNR or DATCP, the record may then be required to be routed through RSP with a revised budget to include the campus' indirect costs, depending on the source of the funding the agency uses to fund the proposal. The division-authorized WISPER record needs to be routed **by 5 p.m. CST Friday, November 21, 2014.**



ED_004892B_00000002-00009

## D. Priorities of Agencies in the WGRMP

### 1. UWS Groundwater Research Program

The University of Wisconsin System (UWS), through its Water Resources Institute (WRI) and its Groundwater Research Advisory Council (GRAC), seeks projects of a fundamental or applied nature on any aspect of groundwater research in the natural sciences, engineering, social sciences, economics or law. For the purposes of this solicitation, "groundwater research" is defined as research that advances the understanding, protection or management of the groundwater resource. Projects that are primarily focused on wastewater or drinking water treatment technologies, surface water protection or soil science must make a clear link to current groundwater science. Projects funded in the current cycle are listed on the WRI website at *http://wri.wisc.edu*. The UWS will have up to $200,000 to fund new projects in FY 16. Because the cost of fringe benefits will affect the amount of money available, the exact level of funding depends on the budgeted categories used in the selected proposals. The remaining funds for UWS groundwater research have been previously committed to ongoing projects.

**Applicant Requirements**

Eligibility-Most often, the PI will be a faculty member on any campus in the UWS. However, academic staff members who have achieved nomination to PI status by endorsement of their relevant academic dean may serve in this capacity. Projects that appear to be continuations of previously funded projects with two years of UWS support and projects that have been twice rejected will not be considered. The UWS also strives to avoid funding situations in which the name of a PI or co-PI appears on more than two UWS projects during any given fiscal year.

Budget Considerations: Projects will not be approved in any one budget cycle for a period of more than two years. Second-year funding will be contingent on satisfactory progress. No capital equipment (more than $5,000 per item) may be purchased. Travel for attendance at scientific meetings will not be accepted. Generally, faculty salaries and fringe benefits to be paid from any project should not exceed 10 percent of the total individual grant. Overhead costs are not allowed. Supplies should not exceed 20 percent of the total individual grant.

Review of Proposals: Two types of peer reviews will be conducted for proposals submitted for UWS consideration. First, WRI participates in the external peer review process for the Joint Solicitation. Reviews are solicited from national and international experts in the field, with a focus on the technical merits of the proposal. Second, the Research and Monitoring Subcommittee of the GCC assembles a panel of state experts to evaluate each proposal's mission relevancy and consistency with UWS priorities.

Final Decision Making: The GRAC, which consists of university, state agency and public representatives, meets as a body to discuss the results of the review process. The GRAC pays close attention to UWS priorities and direct relevance to groundwater issues in their deliberations. The GRAC recommends a priority list of projects that the UWS should strive to fund in accordance with budgetary resources. A suitable UWS Groundwater Research Program is then assembled by the WRI and submitted to the GCC, which advises the Department of Administration on the release of UWS research funds upon passage of a state budget.

Reporting: All applicants will be notified about the results of the review process by the end of March 2015. Principal investigators on awarded projects shall submit a progress report at the end of each project year using WRI's Web-based reporting application, *iPRO*. Annual progress reports are due each year in July. A final report and a two-page project summary shall be submitted through the *iPRO* system within 90 days after the project end date.



ED_004892B_00000002-00010

## UWS Research Priorities

The UWS Groundwater Research Priorities for Wisconsin were developed by the UW Groundwater Research Advisory Council (GRAC). The council members have statewide expertise on groundwater research and policy. UWS funding for groundwater research is administered through the UW Water Resources Institute, which is an active member of the National Institutes for Water Resources (NIWR). The National Institutes were established to implement the provisions of the Water Resources Research Act of 1984 (Public Law 98-242) through the collective activities of the 54 member agencies. The strategic plan for NIWR contains three objectives designed to "provide relevant and timely information that can assist the Nation's water resource managers in their development and implementation of programs aimed at providing a sustainable water supply." These national objectives align well with the UWS Groundwater Research Priorities and were used as a framework to organize the list below. This synergy between local and national goals highlights Wisconsin's leadership in groundwater research and protection.

**Objective A: Maintain or enhance *groundwater quantity***

- Implications of the Great Lakes Basin Compact for groundwater use, high-capacity wells, and the resulting economic impact on Wisconsin and the region.
- Assessments of water availability and the impacts of human water use on groundwater levels, groundwater storage, surface water features and ecological features.
- Effects of climate change and variability on groundwater levels, flow patterns and quantity.
- Impact of land-use practices on groundwater quantity, including the effects of agricultural, industrial, municipal, residential or waste management activities that recharge groundwater.
- Develop strategies for maintaining and enhancing groundwater availability.

**Objective B: Maintain or enhance *groundwater quality***

- Identification and characterization of chemical and biological pollutants in groundwater systems and their threats to ecosystems and human health, including the type, toxicity and persistence of degradation products.
- The occurrence, significance and implications to human health of viruses in groundwater.
- Effects of climate change and variability on groundwater quality.
- Impact of land-use practices on groundwater quality, including the effects of agricultural, industrial, municipal, residential or waste management activities that contaminate groundwater.
- Interactions of groundwater and surface water, including chemical transformations in the hyporheic zone; impacts of groundwater withdrawal on surface waters; influence of groundwater discharge on surface-water quality; and wetland impacts on groundwater.
- Impacts of alternative fuel production and use (including blends) on groundwater quality.
- Strategies for ensuring high-quality groundwater in the face of climate change.
- The occurrence, significance and implications to human health of viruses in groundwater.
- Controls on pollutant transport in groundwater, including the development or validation of predictive models.

**Objective C: Maintain or enhance *groundwater management***

- Investigations into the best methods for optimizing groundwater use for human and environmental needs in Wisconsin, including strategies for long-term management in the face of changing climate.
- Development and evaluation of tools or protocols designed to evaluate the environmental impacts of proposed high-capacity wells.
- Development and use of new technologies for groundwater characterization or management.
- Economic impact of groundwater use.



ED_004892B_00000002-00011

- Impacts of contaminated groundwater on Wisconsin families, including human health effects on reproduction, development and chronic disease; or on economic losses attributable to groundwater contamination.
- Implications of climate change on groundwater management.

**2. DNR Groundwater Monitoring and Research Program**

The Wisconsin Department of Natural Resources (DNR) supports monitoring and research on drinking water and groundwater-related topics. Funding for these projects comes from a variety of state and federal sources and supports a wide variety of topics (see a complete list of projects funded through the joint solicitation at: *http://dnr.wi.gov/topic/groundwater/documents/GCC/MonitoringResearch/AllProjects.pdf*).

The DNR anticipates having approximately $150,000 - $250,000 to fund new monitoring and research projects in state FY 16 (July 1, 2015 through June 30, 2016). Specific research and monitoring needs are prioritized and listed after the application requirements.

**Applicant Requirements**

Eligibility: Funds are restricted to UWS and state agency contractors. Others may submit proposals if they include a state-affiliated co-project investigator. The DNR encourages applicants to include a UWS-eligible investigator to maximize funding options.

Budget Considerations: Contracts will be approved on an annual basis. Project cost will be a factor in selection. Budget items should include personnel costs, supplies, equipment and necessary travel. State funds cannot support indirect costs or the purchase of capital equipment.

Contractual Requirements: Projects must meet all departmental requirements and guidelines related to groundwater monitoring wells (installation, documentation and abandonment/filling and sealing), sampling, laboratory analysis and data management. See chapters NR 141 and 149, Wis. Adm. Code, for more information.

Reporting: The project investigator shall submit quarterly project status reports to the DNR project manager within 30 days of the end of each quarter. A final report and a two-page project summary shall be submitted to the project manager within 60 days of the end of the contract period. The final report must contain thorough documentation of methods, all the data collected, and a discussion of how the results of the project can and should be used by decision makers.

Review of Proposals

All proposals will be reviewed and rated by DNR staff and members of the Groundwater Coordinating Council's Research and Monitoring Subcommittee for technical merit and relevance to the Monitoring and Research Priorities and Ongoing Needs listed below. Proposals should contain a clear discussion of the expected practical application of the project results. This will help the reviewer understand the importance of the proposed research and will ensure that the researcher designs the project with the practical application of results in mind. In making final funding decisions, the Bureau of Drinking Water and Groundwater will formulate its recommendations based on input from all project reviewers and available funds. The director of the DNR's Bureau of Drinking Water and Groundwater will make the final funding decisions.



ED_004892B_00000002-00012

## DNR Monitoring and Research Priorities

The DNR has identified the following priorities for groundwater monitoring and research for FY16. These are specific ideas for projects for which state groundwater experts see an immediate need. Funding preference will be given to project proposals that address one or more of these priorities.

**A. Evaluation of Fertilizer (Commercial or Waste) Management Practices for Protection of Groundwater and Drinking Water Wells.** Nitrogen and bacteria are leading causes of drinking water well contamination in Wisconsin. Viruses are an increasing concern. Research is needed to determine effective management practices and site characteristics for fertilizer application that are protective of drinking water wells and groundwater. Projects should address acute and/or chronic impacts to groundwater and may focus on one or more of the following:

- Develop and evaluate assessment and decision tools to help agricultural and other landowners cost effectively apply fertilizers while reducing the potential for groundwater contamination
- New cost-effective monitoring designs and analytical tools
- Occurrence of associated contaminants (pharmaceuticals, viruses, other pathogens, etc.).

**B. Viruses and Other Microbial Contaminants.** Public water systems are increasingly contaminated by viruses and other microbial agents. Private wells are also at risk. Work is needed to: 1) evaluate well construction methods for susceptibility to viruses; and 2) research virus types, effects, routes of exposure, what people are impacted and drinking water implications.

**C. Information to Support Management of Water Use to Protect Ground and Surface Water Supplies.** To help facilitate sound water management and carry out state laws, the DNR needs additional data and information on the following topics:

- Assessing cumulative pumping impacts and achieving sustainable water use (methods to predict, evaluate and mitigate cumulative adverse impacts of groundwater pumping on waters of the state to determine sustainable pumping levels to protect and improve public health, environment and the economy).
- Impacts of high-capacity wells on surface waters (refine our understanding of groundwater-surface water interaction, e.g. streambed conductance, stream-flow depletion; recharge area identification, assessment of irrigation practices and consumptive use coefficients for agricultural applications, evaluation of land-use change impacts, as well as characterization of wetland and lake hydrology).
- Other groundwater quantity goals needing support from monitoring and research include:
  - Identification of groundwater recharge areas and enhancement of natural recharge
  - Identification of groundwater-dependent environmentally sensitive resources (e.g. calcareous fens)
  - Assessment of extent of stormwater contaminant conveyance to groundwater
  - Relationship between high groundwater use and changes in groundwater quality
  - Development of basin-scale groundwater budgets

**D. Source Water Protection Tools.** Research is needed on the following topics to assist communities protect their drinking water sources.

- Hydrogeologic methods to characterize the vulnerability of municipal drinking water systems to contaminants and to set priorities for managing contaminant sources
- Development of simple economic analysis tools to help communities evaluate



ED_004892B_00000002-00013

investments in groundwater protection as compared to water treatment
- Assess the extent and effectiveness of source water protection efforts, including education and outreach programs, in Wisconsin

## DNR Ongoing Needs

The DNR, the Research and Monitoring Subcommittee of the GCC, other state agency staff and university researchers also suggest the topics listed below. While the department will give preference to proposals that meet the priorities above, the following important needs will also be considered.

**Occurrence of Groundwater Contaminants** – Refined information is needed about the extent, causes and forecasting of elevated nitrate, arsenic, sulfate, total dissolved solids (TDS), low pH, radium, molybdenum, organic and inorganic contaminants from construction and demolition landfills and from composting facilities, and other water-quality problems in order to give advice to homeowners, municipalities, facility operators and well-drilling contractors.

**Springs** – DNR continues to seek updated springs inventory and flow information and better information about spring hydrology to assess impacts of high-capacity wells on spring flow rates and characterize the susceptibility of certain spring types or size categories to impacts as a result of groundwater drawdown.

**Health Effects of Groundwater Contaminants** – Research is needed to better characterize the impact of contaminated groundwater on public health.

**Emerging Groundwater Contaminants** – Research is needed to determine whether certain emerging substances (pharmaceuticals, antibiotics and hormones, pesticide breakdown products, viruses, prions and other microbial agents) pose a threat to our groundwater resource and to human health.

**Evaluation of Impacts to Groundwater by Waste Disposal Methods** – Demonstration and evaluation of techniques to measure and enhance the effectiveness of land treatment of waste in preventing nitrogen from entering groundwater.

**Protecting Groundwater from Impacts by Stormwater Infiltration** – Evaluation of the impacts of stormwater-management practices in areas susceptible to groundwater contamination to assess the extent of contamination and to develop and demonstrate innovative techniques to reduce contamination.

**Groundwater Monitoring and Data Analysis** – Development of a process for routine analysis of currently gathered data (Groundwater Retrieval Network, DATCP, Wisconsin Groundwater Center and others) to detect emerging trends and proactively address groundwater and drinking water contamination issues. In addition, modernization of the State Observation Well Network is needed for drought and flooding preparedness as well as land-use planning.

**Resource Definition** – Studies are always needed to better describe the geologic, hydrogeologic and geochemical conditions that affect groundwater quality and quantity in a specific aquifer or area of the state (e.g., contaminant transport in karst areas).

**Monitoring Techniques** – Methodology for groundwater monitoring is constantly evolving. There is a need to evaluate new techniques to ascertain that they are effective in the field.



ED_004892B_00000002-00014

*Contact Mary Ellen Vollbrecht, DNR (Mary.Vollbrecht@wisconsin.gov) or William L. Phelps, DNR (William.Phelps@wisconsin.gov) for more information if you have questions about the DNR's Groundwater Monitoring and Research Program.*

**3. DATCP Pesticide Research Program**

The Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) Pesticide Research Program is administered by the Agricultural Resource Management Division. Due to budget constraints, DATCP will not have money to fund any new projects in FY 16. DATCP will, however, take part in the proposal review process and recommend funding for projects that meet their research objectives. Contact Jeff Postle (608-224-4503) for more information about DATCP research priorities if you intend to submit a pesticide-related proposal to another funding agency. Investigators should note that the focus of the DATCP program is on pesticide and nutrient research, which includes but is not limited to groundwater issues.

**DATCP Research Priorities**

**a. Evaluation of Nutrient Management Practices on Water Quality.**
This research should focus on the effects of nitrogen and phosphorus management practices on groundwater or surface water quality, evaluate models for predicting nutrient impacts on water resources or evaluate the success of nutrient-management planning.

**b. Evaluation of the Environmental Fate Investigation Strategies and Remediation Alternatives for Contaminated Soil and Water at Pesticide Spill Sites.**
Research should investigate the degradation and movement of pesticides at spill sites, develop criteria on the need for and appropriate extent of remedial actions, and evaluate various methods for investigation and remediation of contaminated soil and water.

**c. Evaluation of Factors Influencing the Patterns of Groundwater Contamination by Pesticides and Pesticide Metabolites in Wisconsin.**
This topic involves examining factors that influence pesticide leaching to determine areas of the state that are susceptible to groundwater contamination by specific pesticides.

**d. Use-Related Monitoring of Pesticides and Pesticide Metabolites in Groundwater.**
This project should study groundwater contamination by field application of pesticides in key environmental settings such as fractured bedrock areas.

**e. Use-Related Monitoring of Pesticides in Surface Water and the Effect of Management Practices on Contaminant Levels.**
Projects on this topic should determine the impacts of pesticide-use practices on surface water quality and evaluate the ability of various management practices, such as stream setbacks, to reduce contamination.

**4. DSPS On-Site Wastewater Treatment System Research Objectives**

The Department of Safety and Professional Services (DSPS) supports research focused on the performance of on-site sewage system designs, products and management practices that can be incorporated into the administrative rules regulating on-site sewage systems. These designs, products or management practices must be:

- Directed toward protecting public health, groundwater and surface water quality;



ED_004892B_00000002-00015

- Result in on-site sewage treatment that is consistent with the provisions of the Groundwater Protection Law;
- Affordable by the average owner of an on-site sewage system; and
- Practical for the climate and soils of Wisconsin.

The department also intends to monitor, on an ongoing basis, the performance of various on-site sewage system methods and technologies. The purpose of the performance monitoring is to provide additional information on the long-term performance of the various on-site sewage system methods and technologies to confirm their reliability, to provide data for improvements and to monitor long-term compliance with the groundwater standards.

Due to budget constraints, the DSPS will not have money available to fund projects in FY16. However, the department will actively participate in the review of proposals and make recommendations to the other agencies participating in the solicitation to help meet department priorities.

**DSPS Research Priority**

Research on the processes of wastewater treatment in soil and the performance of soil absorption components.



ED_004892B_00000002-00016